CHAPTER 1042
Water Systems

EDITOR'S NOTE: Unless otherwise indicated, this chapter was enacted on January 4, 1960, and amended on April 2, 1962, February 4, 1963, and March 18, 1969.

CROSS REFERENCES
Sanitation Authority - see ADM. Ch. 260
Application of water well regulations - see S.U. & P.S. 1040.02
Water use restrictions - see S.U. & P.S. 1044.05 et seq.
Water facilities in subdivisions - see P. & Z. 1245.08

1042.01 PERMIT REQUIRED; PLANS.

No new water system to serve, or to be capable of serving, three or more connections shall be established and no extension of a previously approved water system shall be made until a detailed plan of such proposed new system or of such proposed extension, with proof of capacity to serve, has been filed with, and a permit therefor has been obtained from, the Board of Supervisors.

1042.02 APPLICATION FOR PERMIT.

Application for a new system or for an extension, as described in Section 1042.01, shall be made in writing; shall state in detail the source of water supply and the number, nature and location of connections to be served (including dwelling units, schools and other public buildings and commercial and industrial establishments, together with the probable number of employees of each such establishment); shall be accompanied by two copies of a preliminary plat (measuring twenty-three inches by thirty-six inches) drawn to scale and showing the location and capacity of pumping stations, treatment plants and storage facilities, and the size, material and extent of proposed water distribution facilities, including mains, valves, fire hydrants and other appurtenances, together with such other pertinent information as the Board of Supervisors or its duly authorized representative may require; and shall show in sufficient detail the manner in which the applicant proposes to meet the standards set

forth in Section 1042.03. Such plat shall be prepared and certified by an engineer duly authorized by the State to perform such work. Such application shall also be accompanied by a certificate from the County Zoning Administrator that the area to be served by the proposed installation has been officially zoned for the particular type or types of land use described in the application and shown on the accompanying plat.

1042.03 COMPLIANCE WITH STANDARDS.

No application shall be approved by the Board of Supervisors and no permit shall be issued for the establishment of any new water system or for the extension of any existing water system, and no work shall be done in connection with any such new system or such extension, except in accordance with the following standards and such other reasonable standards as may be applicable to the particular application:

(a) Capacity to Serve.

(1) The proposed new system or the proposed extension for which a permit is requested shall have sufficient supply and adequate capacity to supply normal maximum demands of all customers, domestic, public, commercial and industrial, maintaining a pressure of not less than thirty pounds per square inch at all points of delivery, without reducing service to any other customer below these requirements. In addition, the supply shall be adequate and the system of sufficient capacity to deliver not less than the following rates of flow for the following periods of time for fire protection, with a residual pressure of not less than twenty pounds per square inch, to at least one point within 500 feet of each building to be served or proposed to be served by such new system or extension simultaneously with the calculated maximum daily water demand:

Population of Community Served	Required Fire Protection Flow (gal./min.)	Required Duration of Fire Flow (hrs.)
500 (or less)	250	2
501 to 1,000	350	2
1,001 to 2,000	450	2
2,001 to 3,000	600	3

(2) For communities with a population served in excess of 3,000, the required fire flow in gallons per minute shall be 400 times the square root of the population in thousands for a duration of three hours plus one hour for each 1,000 population over 3,000, up to a maximum of ten hours.

(3) In considering an application for proposed new water systems and proposed extensions of existing systems, the Board of Supervisors or its duly authorized representative shall use the following criteria in estimating the normal maximum water demands:

A. Residential population = N = number of dwelling units times 3.5;

B. Average daily water demand per residential population in gallons per day (g.p.d.) = R;

1. For communities served by a public sewage system, R = N x 75; or
2. For communities not served by a public sewage system, R = N x 55;

C. Average daily commercial and industrial water demand in g.p.d. = C = number of commercial and industrial employees x 100*;
D. Allowance for loss and waste in g.p.d. = L = (R + C) x 0.10;
E. Average daily water demand in g.p.d. = A = R + C + L;
F. Maximum daily water demand in g.p.d. = M = A x 1.80;
G. Peak hour demand in g.p.d. = P = M x 1.50; and
H. Peak hour demand in gallons per minute (g.p.m.) = P + 1440.

*Note: Appropriate additional water demand allowance will be made for commercial and/or industrial establishments having high water demands and for schools attended by appreciable numbers of students from outside the area served by the water system under consideration.

(4) Capacity available to serve the aforesaid demands shall be determined by one of the following methods:
A. The total capacity of all mechanical units less the largest or most important unit which is assumed to be out of service for repair at the time of maximum demand (not required of water systems serving less than 1,000 population); or
B. The total capacity of all mechanical units where reserve elevated storage is provided in sufficient quantity to meet the aforesaid demands with the largest or most important mechanical unit out of service for the time required to repair or replace the unit (not applicable to water systems serving more than 1,000 population).

The total capacity of all mechanical units (wells, other sources of supply or pumps) operating simultaneously shall be at least fifty percent more than such demands, except that this requirement shall not be applicable to water systems serving more than 5,000 population.

(5) Pumps, wells, other sources of supply and/or treatment facilities shall have adequate available capacity, as defined in paragraph (a)(4) hereof, to supply:
A. The maximum day rate plus the fire demand, or the peak hour rate, whichever is greater where inadequate elevated storage is provided;
B. The maximum day rate plus the fire demand rate where elevated storage equals or exceeds twenty percent of the maximum day demand for equalization of demands; and
C. The maximum day rate only where elevated storage equals or exceeds twenty percent of the maximum day demand plus 100 percent fire flow requirement for the duration required.

(b) Quality of Water. All water furnished for domestic, commercial or industrial consumption shall be of such quality as to meet all requirements of the State Department of Health.

(c) Water Mains and Fittings. Mains and fittings of sixteen-inch inside diameter (I.D.) or larger shall be of reinforced concrete water pipe, cement-lined cast-iron water pipe or asbestos-cement water pipe. Mains and fittings of six-inch I.D. and up to, but not including, sixteen-inch I.D. shall be of cement-lined cast-iron water pipe or asbestos-cement water pipe. Mains and fittings of less than six-inch I.D. shall be of cement-lined cast-iron water pipe. All mains and fittings shall be designed to withstand a normal working pressure of not less than 150 pounds per square inch and earth cover of at least five feet and shall conform to the standard specifications of the American Water Works Association. No main shall be less than six-inch I.D. except in the case of dead-end streets or where it is used parallel to transmission mains or larger distribution mains located within the same street or right of way or connections between larger mains for furnishing domestic service only, and in no case shall any water main be less than two and one-fourth inch I.D. No water main serving one or more fire hydrants shall be less than six-inch I.D.

All dead-end water mains shall have adequate blow-off valves at the ends thereof. Automatic air-relief valves shall be installed at the high points of water mains where accumulation of air may interfere with the flow.

All mains shall be laid at sufficient depth below the final finished ground surface grade to give at least thirty inches of cover over the top of the pipe.

The horizontal distance between water mains and existing or projected sewers shall be not less than ten feet, except where the water mains are located at a higher elevation (one-foot minimum) than the top of the sewer, in which case a minimum horizontal distance of six feet will be permissible.

(d) Valves. All valves shall conform to the standard specifications of the American Water Works Association and shall open to the left. Valves shall be installed at appropriate points in all water mains so as to permit the cutting off of water from sections of reasonable length. Each valve shall be accessible for operation with a standard valve key through an approved valve box extending to the ground surface.

(e) Fire Hydrants. All fire hydrants shall conform to the American Water Works Association standard specifications for fire hydrants for ordinary water works service. Such hydrants shall have two two and one-half inch nozzles and one four and one-half inch pumper nozzle with National Standard fire hose coupling screw threads. Nozzle caps shall be provided for all outlets with suitable gaskets to provide a tight seal with the nozzles. Such caps shall be securely chained to the barrel of the hydrant. Cap nuts shall have the same dimensions as the operating nut of the hydrant. The size of the main valve opening of the hydrant shall be not less than four and one-half inches. The hydrant shall connect to a six-inch branch pipe line in which is located an isolating gate valve at least four feet from the hydrant.

In new water systems serving subdivisions and in extensions of previously approved water systems serving subdivisions, fire hydrants shall be installed in such a manner that there will be at least one hydrant within 500 feet of the center of the front property line of each lot served by such new system or by such extension.

In commercial and industrial areas, the spacing of fire hydrants shall be such as to give adequate fire protection as determined by the nature, size and spacing of buildings. In no case shall more than 600 feet of hose be required to reach any point at the base of any exterior building wall from the nearest fire hydrant.

(f) Installation of Water Mains, Fittings and Appurtenances. All installations shall be made in accordance with the American Water Works Association standard specifications for such installations and with any special supplementary instructions issued by the manufacturers of the equipment being installed.

(g) Testing of Water Mains. All water mains shall be tested under normal operating water pressure and all leaks shall be stopped before being covered. If it is necessary to cover any such main or a portion thereof before such test, the Board of Supervisors or its duly authorized representative shall prescribe an acceptable test which shall be made by the holder of the permit.

(h) Review of Application. In making its review of the application and accompanying preliminary plat, the County reserves the right to require such changes, including changes in pipe sizes, as it may consider necessary in order to:

(1) Meet the requirements of these standards; and

(2) Permit future extensions where circumstances so indicate.

(i) Issuance of Permit. Upon delivery of the application to the County by the applicant, as hereinbefore provided, the County may issue the official permit for the installation of the project. The applicant is hereby placed on notice that any installation work he may do on the project prior to the issuance of such permit is done entirely at his own risk.

(j) Notice of Construction. The holder of a permit hereunder shall notify the County Administrator of the actual installation of any water main or other facility covered by such permit at least forty-eight hours prior to the covering up of such main or facility in order to permit inspection and testing thereof.

1042.04 LIMITATIONS OF CHAPTER.

Nothing in this chapter or in the issuance of a permit under this chapter shall permit the installation or extension of any water system in violation of any of the provisions of the County Subdivision Regulations or without first obtaining from the County Planning Commission the approval required by Section 15.2-2232 of the Code of Virginia of 1950, as amended.
(Ord. 98-01. Passed 3-18-98.)

1042.05 PROHIBITION OF USE PRIOR TO APPROVAL.

None of the facilities constituting any part of a water system shall be used, in whole or in part, unless and until the Director of the Department of Building and Development has given his unconditional written approval of all facilities comprising such system. (Ord. 91-23. Passed 9-17-91.)

1042.99 PENALTY.

(EDITOR'S NOTE: See Section 202.99 for general Code penalty if no specific penalty is provided.)